

NEXT GENERATION TEXAS

# IS IT A WRAP FOR THE TEXAS RAPS?

WRITTEN BY  
**Jorge Borrego**  
February 2024



# TABLE OF CONTENTS

<b>Executive Summary</b>	Page 3
<b>Introduction</b>	Page 4
<b>From Apprenticeships to Registered Apprenticeships</b>	Page 4
Differences Between Apprenticeships and Registered Apprenticeships	Page 5
How Apprenticeships Are Defined in Texas Statute	Page 5
<b>How to Become a Registered Apprentice</b>	Page 6
<b>The Role RAPs Play in Licensing</b>	Page 6
<b>Methodology</b>	Page 7
Data Sources	Page 7
Calculating Totals for Counties	Page 7
Calculating Totals by Industry and Occupation	Page 7
<b>What Do RAPs Look Like in Texas?</b>	Page 7
Construction	Page 8
Healthcare	Page 9
Transportation	Page 10
<b>Where Are RAPs Located?</b>	Page 11
Construction	Page 11
Healthcare	Page 12
Transportation	Page 13
<b>Discussion and Recommendations</b>	Page 13
Discussion	Page 13
Recommendations	Page 14
<b>Conclusion</b>	Page 16
<b>References</b>	Page 17

# IS IT A WRAP FOR THE TEXAS RAPs?

WRITTEN BY Jorge Borrego

## KEY POINTS

- **The Registered Apprenticeship Program (RAP)** is the largest federally sponsored work-based learning program.
- **The largest portion** of RAPs are in industries like construction and health science, which usually require some postsecondary training but not a bachelor's degree. Professions in these industries are sometimes described as "middle-skill" jobs.
- **Middle-skill occupations** are expected to grow by more than 900,000 by 2030.
- **Despite the high demand** for individuals with these skills, there were less than 31,000 active Registered Apprenticeships in 2023.
- **Giving the Texas Workforce Commission** the authority to designate apprenticeable occupations will empower employers to create new work-based learning opportunities.

## EXECUTIVE SUMMARY

Work-based, earn-while-you-learn programs existed in various forms, either formal or informal, for centuries. This changed in 1917 with the Smith-Hughes Act, the first federal attempt to standardize the apprentice-employer relationship by attaching federal vocational aid to extensive and comprehensive training standards. Two decades later, in 1937, Congress passed the National Apprenticeship Act, which created the Registered Apprenticeship Program. Registered Apprenticeship Programs are work-based, earn-while-you-learn training programs that allow an individual to reskill and upskill quickly (typically one to three years; [Apprenticeship Texas, 2020, p. 2](#)). These programs come with stringent reporting requirements and remove autonomy for employers by proscribing program design and a required entrance and exit wage for apprentices. These features of the program can disincentivize employers from engaging with the program.

As we will show, the Registered Apprenticeship Program reporting and program requirements help explain the vast disparity between workforce demand and the number of apprentices aligned with each industry. As the administrative and program construction requirements place a heavy burden on employers without dedicated staff whose purpose is to complete the RAPs reporting requirements. The purpose of this paper is to provide an analysis of whether the Registered Apprenticeship Program is meeting the workforce demands of Texas and to provide recommendations on how to expand earn-while-you-learn opportunities that can better serve Texas. Specifically, we examine three industries: construction, healthcare, and transportation. These industries were chosen because they are the three industries with the most active registered apprentices, making up approximately 59% of all the apprenticeships in the state.

This paper finds that for every active construction registered apprentice in the state, there are 19 available positions in their aligned NACIS classified industry. Similarly, this paper finds that for every healthcare registered apprentice and transportation registered apprentice, there are 148 and 238 available positions, respectively, by industry. Lastly, this paper offers three policy solutions that could help close the workforce gap in Texas.

## INTRODUCTION

On March 31, 2023, the *Wall Street Journal* published an article on the growing distrust in traditional higher education among Americans ([Belkin, 2023](#)). Polling found that nearly 60% of participants between the ages of 18 and 34 believed that the price of a four-year degree was not worth the cost. The public skepticism is understandable, as research by the Texas Public Policy Foundation found that there are 58 low-performing programs (in terms of debt-to-income ratios) at Texas public universities ([Gillen, 2022](#)). The article later went on to say that “enrollment in U.S. colleges declined by about 15% over the last decade while the growth in alternative credentials, including apprenticeships, increased sharply” ([Belkin, 2023, para. 7](#)). These trends in enrollment have similarly been found in Texas, where enrollment in four-year higher education has declined while enrollment in technical schools has increased since 2020 ([Texas Higher Education Coordinating Board, 2023](#)). It is easy to see why following a pathway to a middle-skill occupation is being seen as increasingly enticing. The Texas Labor Market Information report found that there were over 165,000 annual job openings in the middle skill occupations (occupations that do not require a bachelor’s degree but do require some postsecondary training or education; [Texas Labor Market Information, n.d.](#)). These job openings are not unique to a single region but in fact available across the entire Lone Star State, from El Paso to Beaumont and from Amarillo to Brownsville.

While educational programs in technical schools are shorter in length than an associate or bachelor’s degree, they still cost the student in terms of tuition and the opportunity cost associated with being out of the labor market for 12 to 18 months. However, there

are educational programs that do offer a technical education while being able to simultaneously earn an income: apprenticeships. Apprenticeship programs benefit students by allowing them to learn the foundational knowledge of an industry while earning a wage and avoiding the cost of tuition. Apprenticeships also benefit the employer as they create a pipeline of skilled employees.

A significant drawback of the registered apprenticeship program is that employers cannot quickly establish a new program due to compliance rules set by the federal government. This red tape can disincentivize employer sponsors from creating apprenticeship programs. As this report will show, the paucity of available programs has contributed to a substantial gap between active apprentices and the number of workers available to fill middle-skill occupations within a respective industry. In fact, in some industries there are several hundred job vacancies for every active apprentice in the state.

In *Are Texas Students Career-Ready? CTE Program Design and Funding in Texas* ([Borrego & Valdez, 2023](#)), we examined the structure and alignment of high school career and technical education (CTE) with regional labor demand. What we found was a general misalignment between CTE programs of study offered in high schools with regional labor demand. In this paper, we turn to the postsecondary sector and find a similar gap between Registered Apprenticeship Programs (RAPs) and regional labor demands. We will briefly describe the history of the Registered Apprenticeship, show how apprentices are distributed across the state, compare the quantity of apprenticeships with the regional demands of the state, and lastly, offer recommendations that would offer alternatives to the RAP programs to better align earn-while-you-learn programs with regional labor demand.

## FROM APPRENTICESHIPS TO REGISTERED APPRENTICESHIPS

Apprenticeships have been a fixture in American society since the founding of our nation, having been recognized as an effective strategy for training new generations of skilled workers. During this time,

an apprentice-master relationship was forged in an informal manner, either by a prospective pupil seeking out a craftsman to act as his mentor, through a letter of introduction, or by a proprietor placing a wanted ad in circulation in the local paper. Many notable figures in American history entered their profession through apprenticeships, such as Benjamin Franklin (printer/ publisher; [National Museum of American Diplomacy, n.d.](#)), George Washington (surveyor), and John Quincy Adams (law; [Massachusetts Historical Society, n.d.](#)). Apprenticeships were a common choice for young adults entering the workforce during the early days of the United States of America. However, despite being a part of American culture from its founding, apprenticeships were never emphasized in the United States as heavily as they were (and continue to be) in European countries, particularly Germany and Austria ([Lerman & Rauner, 2012, p. 175-176](#)).

The first landmark piece of legislation came in 1937. Against the backdrop of the Great Depression and with the need to reskill the American workforce, the United States began to fund and support apprenticeship programs by signing the National Apprenticeship Act ([Apprenticeship USA, n.d.](#)), which established the Registered Apprenticeship Program. Registered Apprenticeship Programs (RAPs) are career pathways that allow employers to train their future workforce. RAPs typically come with federal grant dollars in exchange for stringent reporting on the progression of an apprentice's skill acquisition, as well as adherence to entrance and exit wages set by the Department of Labor. Apprentices can expect to obtain paid work experience, classroom instruction, and a portable, nationally recognized credential. RAPs are industry-vetted and approved by the U.S. Department of Labor. Some of the features of all registered apprenticeship programs include:

- **Earn-while-you-learn:** Apprentices are able to earn a wage while they participate in the program.
- **On-the-job training:** Programs provide structured on-the-job training and include instruction from an experienced instructor.

- **Credentials:** Apprentices earn a portable, nationally recognized credential.

Recently, however, apprenticeships have reentered public debate due to the federal red tape associated with launching new Registered Apprenticeship Programs.

### ***Differences Between Apprenticeships and Registered Apprenticeships***

At first glance, the difference between the colloquially used term "apprenticeship" and the formally defined term "Registered Apprenticeship" may not be apparent. However, the differences between the two terms have substantial consequences in attracting employer sponsors and in fostering innovative programs. Generally speaking, apprenticeships have existed for centuries and are constructed as an agreement between the employer and apprentice. By being an employer-led program, this allows for education and training to adapt and evolve with the progression of each industry. In contrast, the Registered Apprenticeship is a standardized training program supervised by the U.S. Department of Labor. This supervision comes with a stringent framework. It is this top-down standardization that can stifle innovation by creating a one-size-fits-all approach.

### ***How Apprenticeships Are Defined in Texas Statute***

To better survey the apprenticeship landscape in the Lone Star State, one must understand the legal framework that defines it. Broadly speaking, on-the-job training programs can be categorized into three classes: Registered Apprenticeships, Industry-Recognized Apprenticeships, and on-the-job training. Beginning with the broadest term, on-the-job training is not defined in statute and therefore employers or educators looking to create an on-the-job training program enjoy the broadest latitude in program construction. Unfortunately, due to the lack of statutory and agency recognition, on-the-job training program hours may not count toward many professional certifications or state licensure. For example, professional credential requirements for a new journeyman electrician requires on-the-job training under a Master Electrician providing some



latitude in program construction ([Texas Department of Licensing and Regulation, n.d.-a](#)), while the credential requirements for a nurse resident or cosmetologist include graduation from an approved practical or education program ([Texas Board of Nursing, n.d.-a](#); [Texas Department of Licensing and Regulation, n.d.-b](#)).

Registered Apprenticeship Programs refer to a specific and federally defined class of apprenticeship programs. In Texas statute, RAPs are defined in [Section 133](#) of the Texas Education Code. Under this chapter, apprenticeship programs are defined as a “training program that provides on-the-job training, preparatory instruction, supplementary instruction,” and most consequently “related instruction in a trade that has been *certified* as an apprenticeable occupation by the Office of Apprenticeship” (defined as the Office of Apprenticeship of the United States Department of Labor). It is the last provision by which state apprenticeship programs are tied to Registered Apprenticeship Programs.

The final class of on-the-job training programs is Industry-Recognized Apprenticeship Programs (IRAPs). IRAPs are defined in statute in [Section 302.252](#) of the Texas Labor Code. Under this chapter, similarly to RAPs, an industry-recognized apprenticeship program is tied to the Office of Apprenticeship but has the option to be certified by a third-party certifier that has received from the U.S. Department of Labor a “favorable determination of qualification to award certification” ([Tex. Labor Code. §302.252](#)). This would have granted additional flexibility to employers to prop up new programs provided that they met the standards of a qualified industry certifier. However, the Biden administration has since rescinded the IRAP program and thus removed this pathway to alternative certification ([Employment and Training Administration, 2022](#)).

## HOW TO BECOME A REGISTERED APPRENTICE

The following steps are to be followed to become a registered apprentice ([Texas Workforce Commission, n.d.](#)):

1. **Find a program:** the first step in becoming a registered apprentice is to identify the program you would like to join.
2. **Contact the program:** After identifying a program, contact the program to inquire about the application process, qualifications, and hiring schedule.
3. **Apply to the program:** Submit your application with the training program of your choice.
4. **Sign the training agreement:** Once hired, an apprentice agreement will need to be completed by you and the employer sponsor. This agreement covers the conditions of the registered apprenticeship, training outline, and wage increments based on skill gains. Lastly, the agreement will be filed with the U.S. Department of Labor by the sponsor.

## THE ROLE RAPs PLAY IN LICENSING

Several occupations require some form of licensing or certification in order to become a practicing professional in the state. Some examples include realtors, barbers, electricians, lawyers, and plumbers. As a requirement for licensure or certification, many occupations require a practical component. This varies depending on a number of different variables such as the complexity of tasks, the number of safety standards that must be mastered, and recommendations from industry. **Table 1** displays the number of hands-on-learning hours that are required for licensure for a subset of occupations.

There are two ways to earn practicum hours: the first is to enter an education center (typically, this is a trade school); the second is to join an apprenticeship program, as defined by chapter 133 of the Education Code ([Texas Education Code §133.001](#)). An important point is that the definition of apprenticeship under Texas statute is tied to the federal definition of apprenticeship under the Department of Labor, which means that (1) state programs must conform to the federal structure and guidelines, essentially creating a one-size-fits-all model across all 50 states; and (2) any new occupation will have to be declared

**Table 1**

*Minimum of On-the-Job Training Required for Licensure/  
Certification, Texas*

Occupations	Required on the Job Training
Electrical Journeyman	8,000 hours
Journeyman Plumber	8,000 hours
Heating & AC Mechanic and Installer	2,000 hours
Registered Nurse Resident	500 hours

**Note.** Data from Texas Department of Licensing and Regulation, n.d.-a (<https://www.tdlr.texas.gov/electricians/apply/individuals/journeyman-electrician.htm>); Texas State Board of Plumbing Examiners, n.d.-a (<https://tsbpe.texas.gov/license-types/journeyman>); Texas Board of Nursing, n.d.-b ([https://www.bon.texas.gov/rr\\_current/217-2.asp.html](https://www.bon.texas.gov/rr_current/217-2.asp.html)); Texas Department of Licensing and Regulation, n.d.-c (<https://www.tdlr.texas.gov/acr/certified-tech-apply.htm>).

apprenticeable by the Department of Labor prior to the establishment of a RAP program, which can take several months to a couple of years to achieve.

## METHODOLOGY

### Data Sources

The data used for our analysis came from two sources: the U.S. Department of Labor and Texas Labor Market Information via the Texas Workforce Commission. The foundation of our analysis was comprised the fiscal year 2023 Registered Apprenticeship Program data file, accessible through [apprenticeship.gov](http://apprenticeship.gov). This list provided all active apprenticeships in the United States. The second source of information we used came from the Labor Market Information. We used information provided by the Texas Labor Market Information, 2020–2030 report (specifically for our analysis, we used the Workforce Area Development Profiles; [Texas Labor Market Information, n.d.](#)).

### Calculating Totals for Counties

To identify the location of different RAP programs across the state, we used the “County FIPS” field within the RAP list. County FIPS codes are unique identifiers for geographic areas, in this case state-county boundaries. Each FIPS code is five digits long with the first two digits corresponding to the state FIPS

code ([Federal Communications Commission, n.d.](#)). This allows us to count the number of apprentices there were within a county in Texas by counting the number of unique apprentice IDs. To create a visual representation of this distribution, we appended the apprentice count to a county shapefile in ArcGIS using County FIPS as unique variable.

### Calculating Total by Industry and Occupation

When calculating the industry totals for annual job openings and apprenticeships, we relied on the NAICS code provided by the apprenticeship located in the data file. While the NAICS codes might be considered broad in their categorization of individual occupations, its utility in aligning industry job growth and apprentice participation naturally lends itself to our analysis. With this limitation in mind, we continue with our analysis.

## WHAT DO RAPS LOOK LIKE IN TEXAS?

Registered Apprenticeships exist across a diverse range of industries—from manufacturing and transportation to finance and healthcare ([My Next Move, n.d.](#)). For the purposes of this paper, we will be turning our attention to three industries: construction, healthcare, and transportation. These industries were selected for two reasons: first, these three

industries make up 59% of all of the apprentices in the state, with construction making up 45% of all apprenticeships; and second, these fields are among the most in-demand fields in terms of labor shortages ([ApprenticeshipUSA, 2023](#)). The shortages in the construction, transportation, and healthcare fields have been the subject of many legislative and executive proposals since many policymakers recognize that their success and growth are tied closely to the success of the state’s economy ([HB 4390, 2023](#); [HB 4411, 2023](#); [HB 4451, 2023](#); [HB 1799, 2021](#); [HB 2784, 2019](#)).

**Construction**

When examining the Registered Apprenticeship Programs within the construction industry in Texas, we find the occupations with the greatest number of registered apprentices are electricians, plumbing and HVAC contractors, building construction contractors, steel and concrete contractors, and power & communication line construction workers. These five occupations represent more than 89% of all apprentices in the construction field.

RAPs are attractive programs for students and workers looking to upskill thanks in part to the ability to earn a wage while learning job functions. An important note to consider is that the starting wage and wage progression is determined by the program sponsor and not the employer ([Eldridge & Boren, 2021](#)). For instance, if in a given region the program sponsor for a RAP in Information Technology is a community college, an employer seeking to hire a registered apprentice will have to agree to a starting salary prior to evaluating the merit of the apprenticeship applicant pool. This feature of the RAP can disincentivize employers from participating in the RAP program. Nevertheless, we thought it necessary to analyze the starting wages of apprentices as starting wages act as a potent motivator for employees. We find that the five occupations with the highest wages all earned an average wage of more than \$19 per hour, translating into a yearly earnings range of \$41,537.60–\$53,768 ([ApprenticeshipUSA, 2023](#)).

**Table 2**  
*Registered Apprenticeships With the Largest Number of Participants, Construction*

NACIS Occupation Title	Total Participants
Electrical Contractors and Other Wiring Install	6,376
Plumbing, Heating, and Air-Conditioning Contractors	3,518
Commercial and Institutional Building Construction	1,981
Structural Steel and Precast Concrete Contractors	1,098
Power and Communication Line Construction	1,054

**Note.** Data from *Data and Statistics*, ApprenticeshipUSA, 2023 (<https://www.apprenticeship.gov/data-and-statistics>).



**Table 3***Average Wage of Registered Apprentices, Construction*

NAICS Occupation	Average Wage
Oil and Gas Pipeline and Related Structures Construction	\$25.85
Power and Communication Line, Related Structures Construction	\$24.21
Poured Concrete Foundation and Structure Contractors	\$22.87
Other Heavy and Civil Engineering Construction	\$21.66
Industrial Building Construction	\$19.97

**Note.** Data from *Data and Statistics*, ApprenticeshipUSA, 2023 (<https://www.apprenticeship.gov/data-and-statistics>).

### Healthcare

In the healthcare field, we found that general medical and surgical hospital apprentices made up the vast majority of all apprentices equating to approximately 92% of the healthcare field. The four next largest occupational fields all made up 7% or less of the industry.

Examining the earning potential of the field, we found that healthcare made up some of the highest earning apprenticeships. The top five highest earning apprenticeship programs earned an average starting wage of more than \$14.00 with salary ranges equivalent to \$29,203.20–\$50,356.80 ([ApprenticeshipUSA, 2023](#)).

**Table 4***Registered Apprenticeships With the Largest Number of Participants, Healthcare*

NAICS Occupation	Total Participants
General Medical and Surgical Hospitals	3548
Child Care Services	244
Home Health Care Services	48
All Other Outpatient Care Centers	16
Other Residential Care Facilities	12

**Note.** Data from *Data and Statistics*, ApprenticeshipUSA, 2023 (<https://www.apprenticeship.gov/data-and-statistics>).

**Table 5***Highest Average Wage of Registered Apprentices, Healthcare*

NAICS Occupation	Average Wage
General Medical and Surgical Hospitals	\$24.21
Other Residential Care Facilities	\$18.28
All Other Outpatient Care Centers	\$17.34
Other Individual and Family Services	\$17.00
Child Care Services	\$14.04

**Note.** Data from *Data and Statistics*, ApprenticeshipUSA, 2023 (<https://www.apprenticeship.gov/data-and-statistics>).

## Transportation

Turning our focus to the transportation industry, we found that the occupations with the most apprentices are scheduled passenger air transport, general freight trucking (long-distance), general freight trucking (local), freight transportation, and deep sea freight transportation.

Examining the median earnings, we find that wages range from a high of \$21.79 to \$7.73 (or approximately \$16,078.40–\$45,323.20 expressed as yearly earnings ([ApprenticeshipUSA, 2023](#))).

**Table 6**

*Registered Apprenticeships With the Largest Number of Participants, Transportation*

NAICS Occupation	Total Participants
Scheduled Passenger Air Transportation	49
General Freight Trucking, Long-Distance, Truckload	44
General Freight Trucking, Local	15
Freight Transportation Arrangement	9
Deep Sea Freight Transportation	5

**Note.** Data from *Data and Statistics*, ApprenticeshipUSA, 2023 (<https://www.apprenticeship.gov/data-and-statistics>).

**Table 7**

*Highest Average Wage of Registered Apprentices, Transportation*

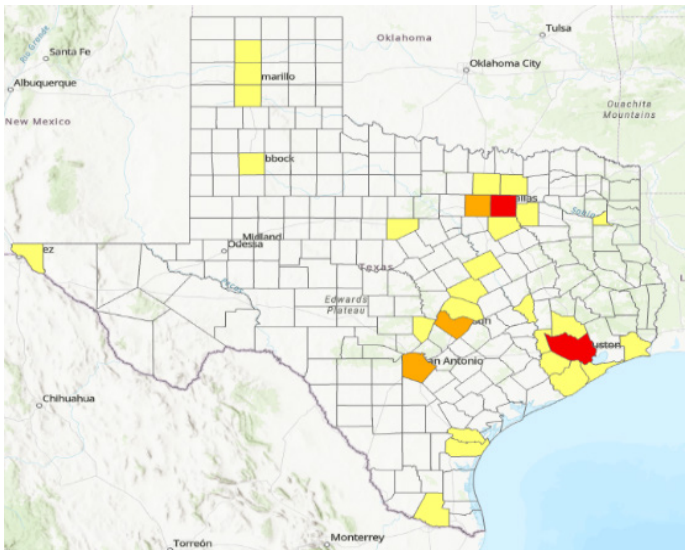
NAICS Occupation	Average Wage
Scheduled Passenger Air Transportation	\$21.79
Deep Sea Freight Transportation	\$18.82
Freight Transportation Arrangement	\$15.00
General Freight Trucking, Local	\$14.73
General Freight Trucking, Long-Distance, Truckload	\$7.73

**Note.** Data from *Data and Statistics*, ApprenticeshipUSA, 2023 (<https://www.apprenticeship.gov/data-and-statistics>).

## WHERE ARE RAPS LOCATED?

The need for skilled labor is felt across the entire Lone Star State, from El Paso to Beaumont and from Brownsville to Amarillo, according to data from the Texas Labor Market Information (LMI) reports on regional labor market needs ([Texas Labor Market Information, n.d.](#)). Similarly, RAPs are offered across the state, albeit with substantially more program offerings in some regions than others. **Figure 1** shows a heatmap of the number of apprentices in each county, with those counties with more than 4,000 active apprentices colored in red, counties with more than 2,000 but fewer than 4,001 apprentices colored in orange, counties with more than 100 but fewer than 2,001 apprentices colored in yellow, and counties with fewer than 100 apprentices not colored in.

**Figure 1**  
*Heatmap, Number of Active Apprentices in Texas Counties*



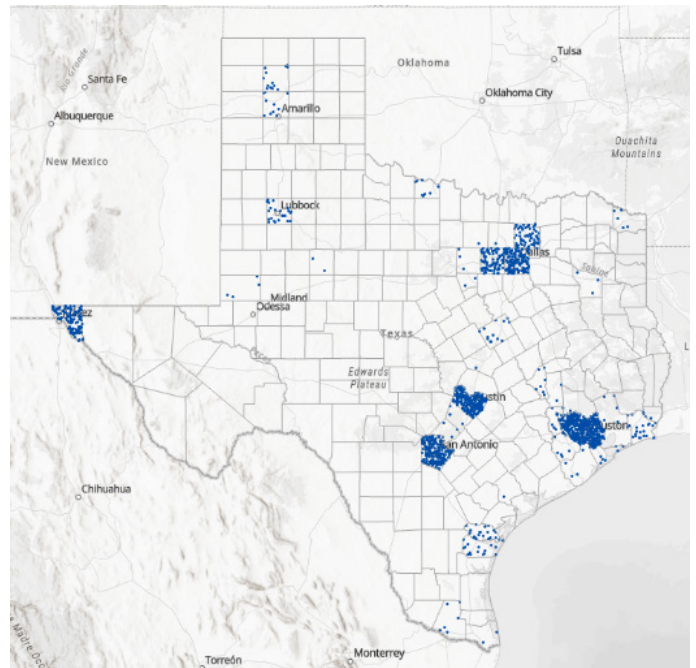
**Note.** Data from *Data and Statistics, ApprenticeshipUSA, 2023*, (<https://www.apprenticeship.gov/data-and-statistics>).

Only two counties had more than 4,000 apprentices—Harris (7,095) and Dallas (6,075)—and only three counties had between 2,001 and 3,999 apprentices—Travis (2,745), Bexar (2,673), and Tarrant (2,630). The vast majority of counties—over 72%—had no active apprentices at all. In the following subsections, we will be exploring the distribution of apprentices across the state disaggregated by industry, as well as the demand for middle-skill occupations within the same industry.

## Construction

The construction trades are by far the most subscribed-to industry out of any apprenticeship program, with construction trades making up more than half of all active apprentices in the state. **Figure 2** is a spatial display of all the active apprenticeships in the construction industry overlaid on a county map of the state. Each blue dot represents 10 active apprentices. When looking at the spatial distribution of apprentices in **Figure 3**, we find—unsurprisingly—that active apprentices are largely located in the state’s most populous counties. Given this predictable distribution, the lack of active apprenticeships in the Rio Grande Valley is especially remarkable. Despite having an estimated population of more than 1.3 million ([Gomez et al., 2022](#)), the metropolitan area only has 75 active apprentices.

**Figure 2**  
*Active Apprentices, Construction*



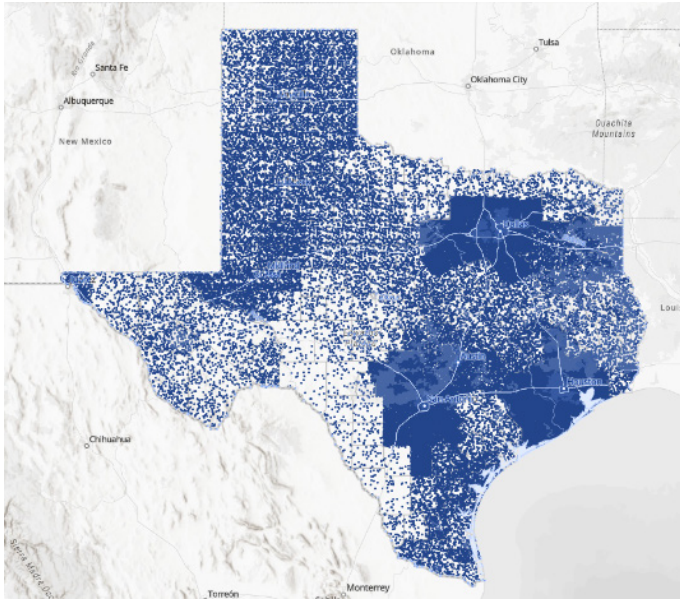
**Note.** Data from *Data and Statistics, ApprenticeshipUSA, 2023*, (<https://www.apprenticeship.gov/data-and-statistics>).

When examining a spatial display of regional demand for the construction industry in **Figure 3**, we see that there is widespread demand in both the rural and urban areas of the state. The gap between the demand for occupations within construction and supply of apprenticeships was the largest in the Panhandle region and in the Rio Grande Valley.



**Figure 3** is a map of all the middle-skill occupational vacancies as identified by the LMI. Like in **Figure 2**, every dot in this image represents 10 available positions. We found that for every active apprentice in the construction trades, there were 19 job openings in the state.

**Figure 3**  
*Middle-Skill Job Openings, Construction*



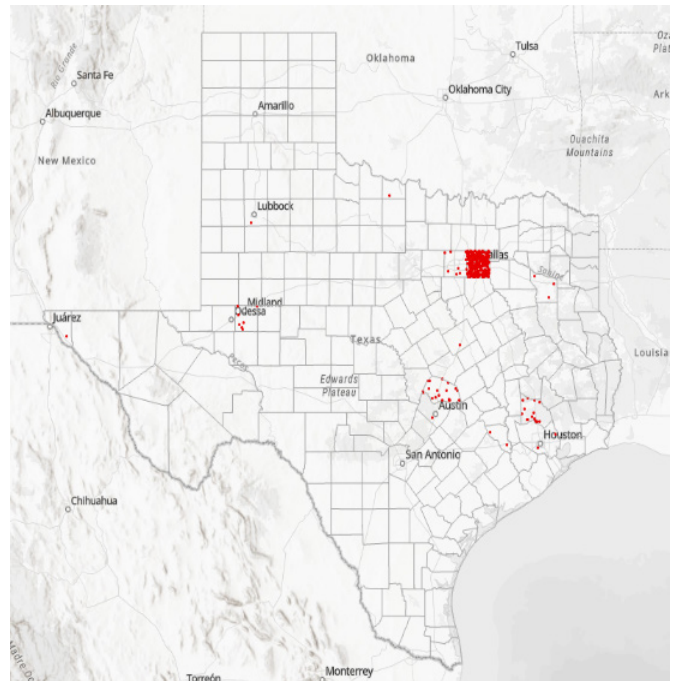
**Note.** Data from *Workforce Development Area Profiles*, Texas Labor Market Information, n.d. (<https://texaslmi.com/EconomicProfiles/WDAProfiles>).

### Healthcare

There is a prevalent need for high quality healthcare providers in Texas, with officials designating much of the state as experiencing health professional shortages ([Texas Health and Human Services, n.d.](#)). Apprenticeships could be a way to bridge the healthcare gap in the state. Unfortunately, there were fewer than 3,100 active nursing apprenticeships in the state as of 2023. Of these active participants, 92% were located in Dallas County ([ApprenticeshipUSA, 2023](#)). **Figure 4** shows a spatial display of all of the active apprenticeships in the healthcare industry overlaid on a county map of the state. Each dot represents 10 active apprentices.

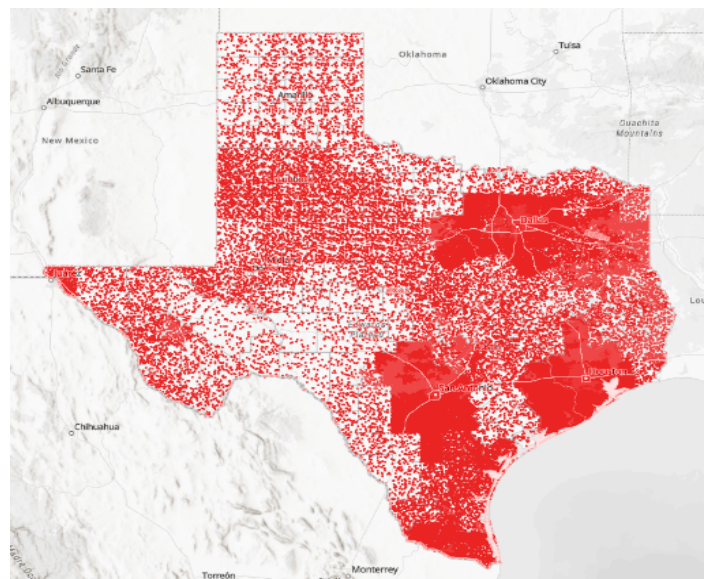
Looking at the regional demand for middle-skilled healthcare professionals, we see that there is a striking need located across the entire state. As in the previous figures, each dot here represents

**Figure 4**  
*Active Apprentices, Healthcare*



**Note.** Data from *Data and Statistics, ApprenticeshipUSA, 2023* (<https://www.apprenticeship.gov/data-and-statistics>).

**Figure 5**  
*Middle-Skill Job Openings, Healthcare*



**Note.** Data from *Workforce Development Area Profiles*, Texas Labor Market Information, n.d. (<https://texaslmi.com/EconomicProfiles/WDAProfiles>).

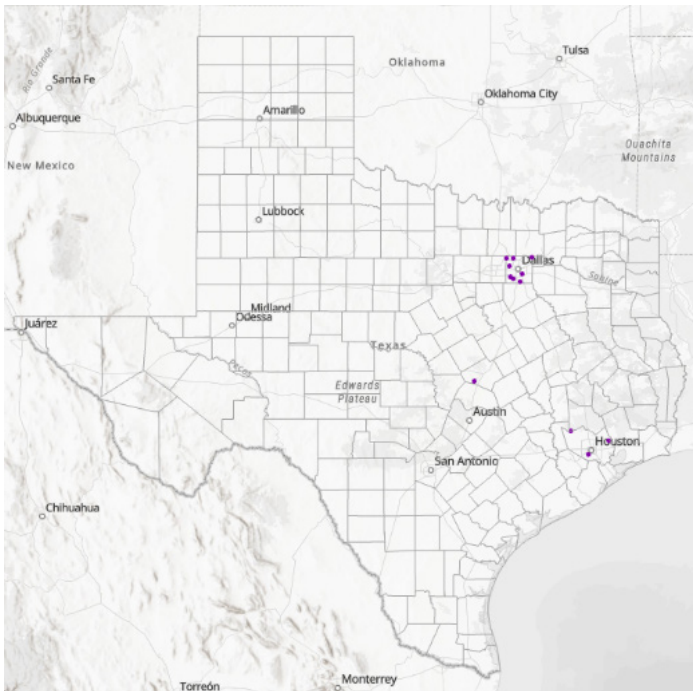
10 openings. The top five regions with the largest demand, in order of greatest demand, were the Gulf Coast (Houston), Alamo (San Antonio), Lower Rio Grande Valley, and North Central Texas. To state

these findings another way, for everyone active healthcare apprentice, there were 148 job vacancies in the state.

### Transportation

The final industry we will analyze is the transportation and warehouse industry. Altogether, there were a total of 122 active apprentices in 2023. Of these, approximately 64% were located in Travis County, 31% were located in Dallas County, and 5% were located in Harris County. **Figure 6** shows the spatial distribution of the active apprenticeships (in the interest of consistency, each dot represents 10 active apprentices).

**Figure 6**  
*Active Apprentices, Transportation*

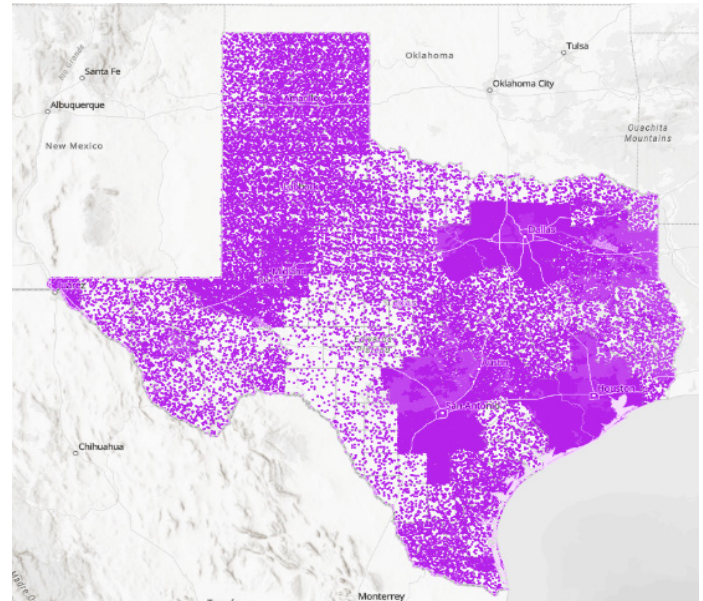


**Note.** Data from *Data and Statistics, ApprenticeshipUSA, 2023* (<https://www.apprenticeship.gov/data-and-statistics>).

Observing the regional demand of middle-skill occupations in the transportation sector, we found that there was a prevalent need across the state for transportation professionals. The top five regions with the largest demand were the Gulf Coast (Houston) with 31,922 openings, Dallas with 21,345 openings, North Central Texas with 11,905 openings, Tarrant County with 11,436, and Alamo (San Antonio)

with 10,912 openings. Comparing the number of active apprentices with the number of available occupations, we find that there are 238 job vacancies for every active apprentice.

**Figure 7**  
*Middle-Skill Job Openings, Transportation*



**Note.** Data from *Workforce Development Area Profiles, Texas Labor Market Information, n.d.* (<https://texaslmi.com/EconomicProfiles/WDAProfiles>).

In the recommendation section that follows, we highlight a state-level policy tool that can empower employers to take the lead on closing the workforce gap between the labor market demand in several growing industries and the supply of competent tradesmen ready to meet those needs. Through this decision, Texas could empower a greater number of students to attain success in their chosen careers.

## DISCUSSION AND RECOMMENDATIONS

### Discussion

In this paper we explored in detail the Registered Apprenticeship Program. In particular, we examined three industries that make up 61% of all apprentices in the state. They are the construction trades, healthcare, and the transportation industry. Among these three industries, we find that the number of active apprenticeships is insufficient by orders of magnitude to meet the regional needs of the Texas economy. As **Table 8** shows, there are multiple vacancies for every one active apprentice in each industry.



**Table 8***Ratio of Middle-Skill Job Openings to Active Registered Apprentices, by Industry*

Industry	Number of Active Apprenticeships	Aggregate Industry Growth by NACIS Code	Ratio (Demand: Apprentices)
Construction	15,735	306,219	19:1
Healthcare	3,874	575,111	148:1
Transportation	271	29,120	238:1

**Note.** Data from Data and Statistics, ApprenticeshipUSA. 2023 (<https://www.apprenticeship.gov/data-and-statistics>) and Workforce Development Area Profiles, Texas Labor Market Information, n.d. (<https://texaslmi.com/EconomicProfiles/WDAProfiles>).

A question that emerges from these findings is: What are the causes of this shortage in apprenticeships? We have identified the following as probable causes for the paucity of program participants and employer sponsors.

- **Responsiveness to industry needs:** Many industries across Texas' economy are experiencing rapid change due to technological innovation. Entire industries can change within a decade. The consequence of an innovative landscape is the need to modify existing training protocols. Unfortunately, it takes years to register an entirely new program with the Department of Labor or to modify an existing program. In an industry such as information technology or advanced manufacturing, this inefficiency could mean that apprentices are learning outdated methods or working with outdated technology.
- **Stringent reporting requirements:** Federal reporting can prohibit an employer from acting as a program sponsor, as the Department of Labor created an extensive list of administrative requirements in order for a sponsor to continue to operate its program under the Registered Apprenticeship Program. In fact, when managing grants that support Registered Apprenticeship Programs, the Texas Workforce Commission has noted that local education agencies and Workforce Development Boards are the entities that tend to have the staff and resources in place to meet the reporting requirements that

come with the grants that fund RAP programs. The reporting requirements include participants' information and expenditures and can be complex and time consuming (Texas Workforce Commission, personal communication, 2023). This has a two-fold effect: (1) it limits the number of available programs and the location of available programs to those counties with an institution capable of handling the administrative burden of the RAPs; and (2) it removes employers from participating in the training of their labor force, potentially costing them thousands of dollars, as new employees will have to be trained or reskilled to work under the standards of operation unique to the employer.

### **Recommendations**

#### **Changes to Workforce Laws**

HB 4390 (2023) would have expanded the framework begun by HB 2784 (2019). HB 2784 passed in the 86th Texas Legislature and opened up an entirely new tranche of apprenticeship opportunities by leveraging the Industry-Recognized Apprenticeship Program (IRAP) created by the Trump administration in 2017 ([Office of Apprenticeship, 2020](#)). To summarize, IRAP programs were established through Executive Order 13801, to help modernize apprenticeship programs and keep with the pace of innovation ([Federal Register, 2017](#)). IRAP programs and RAP programs differ in a number of ways, but the key difference is that IRAPs allow employers program flexibility without the restrictions from federal oversight. Employers can set wages, hourly requirements for hands-on

and related instruction, and the ratio of professionals to apprentices, factors that come proscribed under the RAP program by the Department of Labor ([Soto & Hindley, 2020](#)). To support the growth of the new program, HB 2784 created the Industrial Workforce Apprenticeship Grant Program to provide extra financial resources to employers seeking to establish IRAP programs.

Then to provide greater flexibility to Texas IRAPs, HB 4390 ([2023](#)) would have granted the Texas Workforce Commission (TWC) authority to certify new apprenticeship programs eligible for the funds created by HB 2784. Since employers would have had the option to create an earn-while-you-learn program as an IRAP, which offers more lenient reporting standards and greater flexibility in program construction, granting the TWC this authority would allow Texas to quickly respond to the needs of industry by certifying new programs once they are successfully vetted through the TWC instead of waiting for their program to be federally vetted. Ultimately, HB 4390 did not pass into law during the regular legislative session.

### Expand the School-to-Apprenticeship Pipeline

Apprenticeships typically serve an age population over 18. This means that a high school student taking career and technical education courses is not able to count their classroom experience as hours working toward an apprenticeship. Allowing a public-private partnership between an employer and a local education agency to establish a pre-apprenticeship program for high school students would create a pathway to licensure for several career areas. Notably, three bills passed by the Texas Legislature accomplish this goal, albeit for only three industries. HB 636 ([2021](#)), in the 87th Texas Legislature, and HB 1391 ([2023](#)) and HB 1859 ([2023](#)), in the 88th Texas Legislature, allow high school CTE courses to count toward licensure hours for tradesman plumber, residential wireman licenses, and air conditioning and refrigeration technician certifications, respectively.

Another mechanism to expand the school-to-apprenticeship pipeline is to create an employer-

led, paid pre-apprenticeship program for high school students, such as HB 4411 ([2023](#)), in the 88th Texas Legislature, attempted to codify. This bill would have created a novel apprenticeship program that was aimed at getting high school students into the workforce through an earn-while-you-learn program. While RAPs can currently service high school students under Texas law, these programs are under subscribed due to their anti-business design, which requires that for the program to operate, an apprenticeship committee, whose membership must contain at least one or more bargaining agents, must be established. The inclusion of bargaining agents on the apprenticeship committee can create an anti-business environment, as bargaining agents' interests are antithetical to the interest of the employer (i.e., they represent the interests of the "employee" not the interests of the employer). Therefore, HB 4411 attempted to establish a separate and distinct employer-led pre-apprenticeship program. Unfortunately, HB 4411 failed to pass during the 88th regular legislative session.

### Codify the adopted rule regarding Texas Industry-Recognized Apprenticeship (TIRA) Grant Program

On August 15, 2023, the Texas Workforce Commission proposed a rule change to Chapter 838 of the Administrative Code that would establish the Texas Industry-Recognized Apprenticeship (TIRA) Grant Program ([Texas Workforce Commission, 2023a](#)). The rule change creates a parallel state recognition by references to the federal Registered Apprenticeship Program and establish the criteria and application process to participate in the Texas Industry-Recognized Apprenticeship Program. By creating a parallel state recognition, the new rules would grant employers the flexibility to meet the changing demands of their industries. Further, the circumvention of the Department of Labor regulations will empower our state's employers to create high-quality apprenticeships without requiring them to adopt standards that do not align with the unique features of their businesses. As of October 31, 2023, this rule was adopted by the TWC ([Texas Workforce Commission, 2023b](#)). However, in order to prevent legal challenges to the rule change, it is recommended that the Texas Legislature codify the rule change.

## CONCLUSION

It is estimated that the middle skills gap could cost the U.S. economy more than \$2.5 trillion over the next decade ([Giffi et al., 2018](#)). In Texas, 56% of the labor market is made up of middle skills workers but only 42% of workers have the required middle skills level training ([Texas Workforce Investment Council, 2021](#)). This 14% education gap comes at a time when trust in higher education has hit an all-time low: Polls find that nearly 60% of those between 18 and 34 believe that the price of a four-year degree is not worth the cost ([Belkin, 2023](#)). One alternative means to reskill and up-skill our workforce is through the use of apprenticeship programs, primarily the Registered Apprenticeship Program. However, as a feature of being nearly 90 years old, RAPs are struggling to meet the workforce needs of the state in the 21st century economy—for example, industries such as healthcare and transportation have 148 and 238 openings, respectively, for every active apprentice.

In this paper, we examined the three industries within the Registered Apprenticeship Program with the most active apprentices. Combined, 59% of all active apprentices can be found in these industries. By using federally available data on active apprenticeships, we were able to analyze information regarding an apprentice's wage, county of employment, and occupation title. Using this information, we looked at which occupations had the highest wages, and

which were most subscribed to, and we performed a spatial comparison between the location of RAPs and the regional labor needs of occupations that align with those industries. What we found was that the Registered Apprenticeship Program, as is, is not sufficient to meet the needs of the growing Texas economy. In every industry we examined, the demand outpaced the supply of apprentices both at the state and regional levels. Therefore, we recommend that Texas pursue alternatives to the RAP program such as the TIRA program, IRAP programs, or relaxing certification/licensing requirements to expand the school-to-work pipeline.

Texas policy leaders must recognize that reliance on a single federal program will not be enough to meet the workforce needs of a growing state. As workforce-related skills continue to evolve alongside new technology, no single pathway will serve apprentices or employers well. A federal program cannot be the one-size-fits-all solution to our labor shortage. Instead, policy should allow employers to be in the driver's seat: to innovate, to replicate, and to expand new programs across our diverse state. Our state's continued growth will depend on expanding work-based learning opportunities. ■

## REFERENCES

- Apprenticeship Texas. (2020, August 14). *Frequently asked questions*. Texas Workforce Commission. <https://www.twc.texas.gov/sites/default/files/wf/docs/apprenticeship-faq-twc.pdf>
- Apprenticeship USA. (n.d.-a). *Our history*. U.S. Department of Labor. Retrieved June 21, 2023, from <https://www.apprenticeship.gov/about-us/our-history>
- Apprenticeship USA. (n.d.-b). *Legislation, regulations, and guidance*. U.S. Department of Labor. Retrieved June 21, 2023, from <https://www.apprenticeship.gov/about-us/legislation-regulations-guidance>
- Apprenticeship USA. (2023). *Data and statistics*. U.S. Department of Labor. Retrieved June 21, 2023, from <https://www.apprenticeship.gov/data-and-statistics>
- Ashton, H., Dollar, B., Giffi, C., Monck, L., Moutray, C., & Wellener, P. (2018). *The jobs are here, but where are the people*. Deloitte. <https://www2.deloitte.com/us/en/insights/industry/manufacturing/manufacturing-skills-gap-study.html>
- Belkin, D. (May 31, 2023). Americans are losing faith in college education, WSJ-NORC Poll Finds. *Wall Street Journal*. <https://www.wsj.com/articles/americans-are-losing-faith-in-college-education-wsj-norc-poll-finds-3a836ce1>
- Borrego, J., & Valdez, E. D. (2023). *Are Texas students career-ready? CTE program design and funding in Texas*. Texas Public Policy Foundation. <https://www.texaspolicy.com/are-texas-students-career-ready-cte-program-design-and-funding-in-texas/>
- Eldridge, M., & Boren, Z. (2021). *Setting wages in your Registered Apprenticeship Program*. Urban Institute. [https://www.urban.org/sites/default/files/publication/104473/setting-wages-in-your-registered-apprenticeship-program\\_0.pdf](https://www.urban.org/sites/default/files/publication/104473/setting-wages-in-your-registered-apprenticeship-program_0.pdf)
- Federal Communications Commission. (n.d.). *Federal Information Processing System (FIPS) Codes for States and Counties*. Retrieved on February 4, 2024, from <https://transition.fcc.gov/oet/info/maps/census/fips/fips.txt>
- Federal Register. (2017). *Expanding apprenticeships in America*. National Archives. <https://www.federalregister.gov/documents/2017/06/20/2017-13012/expanding-apprenticeships-in-america>
- Gillen, A. (2022). *Holding Texas colleges accountable for student loan debt and earnings outcomes: 2022*. Texas Public Policy Foundation. <https://www.texaspolicy.com/wp-content/uploads/2022/09/2022-09-RR-NGT-HoldingTXCollegesAccountableSLDebtEarningsOutcomes2022%E2%80%93Gillen.pdf>
- Gomez, R., Guajardo, L., & Ely-Ledesma, E. (2022, June 15). *It is time to recognize the Rio Grande Valley as a rising borderland metropolis*. Urban Edge, Kinder Institute for Urban Research. <https://kinder.rice.edu/urbanedge/it-time-recognize-rio-grande-valley-rising-borderland-metropolis>
- HB 636. 87th Texas Legislature. Regular. (2021). <https://capitol.texas.gov/BillLookup/History.aspx?LegSess=87R&Bill=HB636>
- HB 1391. 88th Texas Legislature. Regular. (2023). <https://capitol.texas.gov/tlodocs/88R/billtext/pdf/HB01391F.pdf>
- HB 1799. 88th Texas Legislature. Regular. (2023). <https://capitol.texas.gov/BillLookup/history.aspx?LegSess=87R&Bill=HB1799>
- HB 1859. 88th Texas Legislature. Regular. (2023). <https://capitol.texas.gov/tlodocs/88R/billtext/pdf/HB01859F.pdf>
- HB 2784. 86th Texas Legislature. Regular. (2019). <https://capitol.texas.gov/BillLookup/History.aspx?LegSess=86R&Bill=HB2784>
- HB 4411. 88th Texas Legislature. Regular. (2023). <https://capitol.texas.gov/BillLookup/History.aspx?LegSess=88R&Bill=HB4411>

- HB 4390. 88th Texas Legislature. Regular. (2023). <https://capitol.texas.gov/tlodocs/88R/billtext/pdf/HB04390E.pdf>
- HB 4451. 88th Texas Legislature. Regular. (2023). <https://capitol.texas.gov/BillLookup/history.aspx?LegSess=88R&Bill=HB4451>.
- Lerman, R., & Rauner, F. (2012). In Barabasch, A., & Rauner, F., *Work and education in America: The art of integration*. (pp. 175-193) <https://link.springer.com/book/10.1007/978-94-007-2272-9>
- Massachusetts Historical Society. (n.d.). *Adams family correspondence, volume 8*. Retrieved on December 27, 2023, from <https://www.masshist.org/publications/adams-papers/index.php/view/ADMS-04-08-02-0056>
- My Next Move. (n.d.). *Browse Careers by Career Clusters*. Retrieved on December 27, 2023. <https://www.mynextmove.org/find/clusters>
- National Museum of American Diplomacy. (n.d.). *Benjamin Franklin*. Retrieved October 6, 2023, from <https://diplomacy.state.gov/encyclopedia/benjamin-franklin-first-american-minister/>
- Office of Apprenticeship. (2020). *Industry-recognized apprenticeship program (IRAP) sponsor fact sheet*. U.S. Department of Labor. [https://www.apprenticeship.gov/sites/default/files/IRAP\\_FAQ.pdf](https://www.apprenticeship.gov/sites/default/files/IRAP_FAQ.pdf)
- Soto, I., & Hindley, I. (2020, November 10). *Industry-recognized apprenticeship programs vs registered apprenticeship programs*. American Action Forum. <https://www.americanactionforum.org/insight/industry-recognized-apprenticeship-programs-vs-registered-apprenticeship-programs/>
- Texas Board of Nursing. (n.d.-a). *Licensure – endorsement information*. Retrieved November 9, 2023, from [https://www.bon.texas.gov/licensure\\_endorsement.asp.html](https://www.bon.texas.gov/licensure_endorsement.asp.html)
- Texas Board of Nursing. (n.d.-b). *Texas Administrative Code*. Retrieved February 4, 2024, from [https://www.bon.texas.gov/rr\\_current/217-2.asp.html](https://www.bon.texas.gov/rr_current/217-2.asp.html)
- Texas Department of Licensing and Regulation. (n.d.-a). *Apply for a new journeyman electrician license*. Retrieved November 9, 2023, from <https://www.tdlr.texas.gov/electricians/apply/individuals/journeyman-electrician.htm>
- Texas Department of Licensing and Regulation. (n.d.-b). *Apply for a cosmetology operator license*. Retrieved November 9, 2023, from <https://www.tdlr.texas.gov/barbering-and-cosmetology/individuals/apply-cosmetologist.htm>
- Texas Department of Licensing and Regulation. (n.d.-c). *Apply for a Technician Certification*. Retrieved February 4, 2024, from <https://www.tdlr.texas.gov/acr/certified-tech-apply.htm>
- Texas Health & Human Services. (n.d.). *Shortage area designations*. Retrieved June 23, 2023, from <https://www.dshs.texas.gov/texas-primary-care-office-tpco/health-professional-shortage-area-designations>
- Texas Higher Education Coordinating Board. (2023, February 3). *Undergraduate enrollment dashboard*. <https://data.highered.texas.gov/enrollment-dashboard-by-cip/>
- Texas Labor Market Information (n.d.). *Workforce development area profiles*. Texas Workforce Commission. Retrieved June 22, 2023 from <https://texaslmi.com/EconomicProfiles/WDAProfiles>
- Texas State Board of Plumbing Examiners. (n.d.). *Journeyman plumber*. Retrieved October 15, 2023 from <https://tsbpe.texas.gov/license-types/journeyman/>
- Texas Workforce Commission. (n.d.). *Find registered apprenticeship training programs*. Retrieved June 23, 2023, from <https://www.twc.texas.gov/services/job-training/find-apprenticeships>
- Texas Workforce Commission. (2023a). *Chapter 838. Texas industry-recognized apprenticeship programs grant program*. <https://www.twc.texas.gov/sites/default/files/ogc/docs/pr-838-tira-grants-8-15-23-twc.pdf>



Texas Workforce Commission. (2023b). *Chapter 838. Texas industry-recognized apprenticeship programs grant program*. <https://www.twc.texas.gov/sites/default/files/ogc/mtg23/commission-meeting-material-103123-item10-frch838-tira-grants-twc.pdf>

Texas Workforce Investment Council. (2021). *Middle-skill STEM occupation index*. <https://gov.texas.gov/uploads/files/organization/twic/Middle-Skill-STEM-Occupation-Index.pdf>

## ABOUT THE AUTHOR



Jorge Borrego is a Post-Secondary Education Policy Analyst for the Next Generation Texas initiative at the Texas Public Policy Foundation.

Prior to joining the Foundation, Borrego was a Legislative Director at the Texas House of Representatives. He also worked in the Nonprofit Sector, working for the Down Syndrome Association of Brazos Valley. Where he worked as an Event Coordinator, Data Administrator, and Policy Administrator. He is currently serving as the Treasurer on the organization's Board of Directors.

Jorge holds a Master of Public Administration from the Bush School of Government at Texas A&M University and a Bachelor of Science in Mathematics from the University of Texas at San Antonio. In his free time, he enjoys reading, meeting new people, and exploring new places with his wife and two dogs.

